IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Snjezana BOGER et al.
Title:	FLUXING AGENT FOR SOLDERING METAL COMPONENTS
Appl. No.:	10/562,154
International Filing Date:	6/25/2004
371(c) Date:	12/23/2005
Examiner:	Mark L. SHEVIN
Art Unit:	1733
Confirmation Number:	6580

PRE-APPEAL BRIEF REQUEST FOR REVIEW

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Sir:

In accordance with the **Pre-Appeal Brief Conference Pilot Program**, announced July 11, 2005, this Pre-Appeal Brief Request is being filed together with a Notice of Appeal.

REMARKS

Rejection under 35 U.S.C. § 103

Claims 1, 4, 5, 15, 19, 35, 36, 39-41, and 43 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over CN 1,413,797 to Peng *et al.* (hereafter "Peng") in view of U.S. Patent No. 5,916,635 Ishii *et al.* (hereafter "Ishii") and EP 1 287 941 to Englert *et al.* (hereafter "Englert"). This rejection is respectfully traversed.

The Office suggests on page 3 of the Office Action that Peng discloses a method of soldering using an active connection agent prepared from nanometer powder which was mixed with water, organic cellulose, and flux.

However, Peng does not disclose or suggest a brazing flux for the brazing of individual heat exchanger parts that comprises, a flux comprising a base material and nanoparticles, wherein the flux contains nanoparticles in an amount between 0.01% by volume and 10% by volume, and wherein the nanoparticles comprise nanoaggregates dispersed in an organic polymer, as recited in claim 1. Claims 4, 5, 15, 19, 35, 36, 39-41, and 43 depend from claim 1.

In particular, the nanopowder disclosed by Peng is not a flux but a bonding material for the bonding agent of Peng. In other words, the nanopowder of Peng melts and solidifies to form a bond between surfaces and Peng discloses that the bonding material further includes a flux, which is separate from the nanopowder material. Peng does not disclose or suggest that the flux includes the nanopowder material. As a result, Peng does not disclose or suggest a flux comprising a base material and nanoparticles comprising nanoaggregates, as recited in claim 1. Nor does Peng disclose or suggest such flux nanoparticles in an amount between 0.01% by volume and 10% by volume, as recited in claim 1.

The Office argues in the Advisory Action dated February 23, 2011 that Peng provides a flux because the nanoparticles are mixed with the flux of Peng to provide a bonding mixture. However, the nanoparticles of Peng are a bonding material and not a flux and thus cannot be a flux comprising a base material and nanoparticles. Peng simply does not disclose or suggest flux nanoparticles, as recited in the claims.

Ishii discloses water-based hydrophilic coatings and fin materials for heat exchangers that use such hydrophilic coatings. See Ishii at col. 1, lines 8-12. The Office asserts on pages 3-4 of the Office Action that Ishii discloses that the hydrophilic coatings are produced by mixing colloidal silica, water-soluble polymers, and anionic surfactants over aluminum fins and then drying the mixture. The Office further argues on page 5 of the Office Action and in

the Advisory Action that it would have been obvious to use a volume percentage of 0.01 to 10 % for nanoparticles in view of Ishii.

However, Ishii does not remedy the deficiencies of Peng because Ishii also does not disclose or suggest a flux comprising, among other things nanoparticles comprising nanoaggregates, as recited in claim 1. Ishii is silent in regard to these features, including the use of nanoparticles in a flux.

The Office argues on page 11 of the Office Action that although the combination of Peng and Ishii does not disclose or suggest a flux that contains nanoaggregates, as recited in claim 1, one of ordinary skill in the art would have "reasonably expected" that the flux of Peng and Ishii would contain such nanoaggregates. The only argument the Office provides in support of this assertion is that the flux of Peng and Ishii would be substantially similar to the flux of claim 1. This is not correct.

Peng and Ishii are silent in regard to a flux comprising, among other things nanoparticles comprising nanoaggregates, as recited in claim 1, and do not support the Office's assertion. The nanoparticles disclosed by Peng and Ishii are not fluxes but instead bonding material and hydrophilic coating material, respectively. The Office provides no other evidence in the art or technical reasoning to support its argument that nanoaggregates would exist, particularly where the prior art is silent in regard to their existence.

The fluxes of Peng and Ishii are not similar to each other or to the flux recited in the claims. The mixture of Peng is used for bonding while the material disclosed by Ishii is a hydrophilic coating material for affecting how a surface interacts with water, not for bonding. As a result, one skilled in the art would not have looked to the teachings of Ishii when considering a modification to the material of Peng and it would not have been obvious to apply the volume percentage of nanoparticles disclosed by Ishii to the mixture of Peng.

Additionally, one of ordinary skill in the art would not modify the bonding material of Peng with the teachings of Ishii and Englert because the hydrophilic coating material of Ishii and the flux of Englert are used for different purposes. To view the materials of Peng, Ishii, and Englert as being equivalent enough so as to modify the bonding material of Peng based

on the properties of the materials of Ishii and Englert is tantamount to changing the functions of the materials of Ishii and Englert. Such a view is non-obvious and improper. MPEP 2143 provides that a rejection based on a rationale of combining prior art elements according to known methods to yield predictable results cannot be maintained if each element in the combination does not merely perform the same function as it does separately. Because the hydrophilic coating of Ishii and the flux of Englert need to be viewed as being applicable to a different function (that is, as a bonding material), this view changes the function of the materials of Ishii and Englert, and is therefore improper.

In addition, the materials of Peng and Ishii do not include flux nanoparticles as a starting material as recited in the claims and thus are not similar to the brazing flux recited in the claims. Therefore, one skilled in the art would not have expected the flux of Peng and Ishii to provide similar properties as the brazing flux of the claims.

Englert discloses a fluxing agent composition for brazing parts, including aluminum or aluminum alloy parts. See Englert at paragraph 0001. The flux of Englert can include $K_{(1-3)}AlF_{(4-6)}$. See Englert at paragraph 0003. However, Englert does not disclose or suggest a flux comprising a base material and nanoparticles comprising nanoaggregates, wherein such flux nanoparticles are in an amount between 0.01% by volume and 10% by volume, as recited in claim 1. In fact, Englert is silent in regard to a flux that includes nanoparticles comprising nanoaggregates. Therefore, Englert does not remedy the deficiencies of Peng and Ishii.

In addition, it would not have been obvious to modify the nanopowder of Peng by the teachings of Ishii or Englert because the nanomaterials of each of these references are used for different purposes with different considerations. In particular, the nanopowder of Peng is used as a bonding agent instead of a flux, the nanomaterial of Ishii is used in a hydrophilic coating, and the material of Englert is used as a flux and does not include nanoparticles. Therefore, one skilled in the art, when presented with the nanopowder of Peng, which is used as a bonding material, would not have looked to the teachings of Ishii or Englert for ways to modify the nanopowder of Peng.

For at least the reasons discussed above, the combination of Peng, Ishii, and Englert does not disclose or suggest all of the features of claim 1.

Claims 27-31

Applicant respectfully submits that claims 27-31 should not have been withdrawn from consideration because the features of claims 27-31 are not limited to any of the species listed in the election of species requirement dated October 23, 2008. The species listed in the election of species requirement are drawn to different materials, such as transition metals, pigments, nanoaggregates, oxides, nitrides, carbides, carbon, coated materials, and grafted materials. The features of claims 27-31 are not drawn to any of these materials or species and should be examined.

With regard to the references relied upon in the rejection discussed above, Peng, Ishii, and Englert do not disclose or suggest the features recited in claims 27-31. In particular, the features of claims 27-31 provide advantages that would not be achieved by a nanopowder provided as a bonding agent, as disclosed by Peng.

CONCLUSION

In view of the foregoing, it is respectfully submitted that a clear error has been made and the application is in condition for allowance.

Respectfully submitted,

Date March 14, 2011 By _____

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